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SciVerse ScienceDirect

Energy Procedia 17 (2012) 299 – 304

Energy Procedia

2012 International Conference on Future Electrical Power and Energy Systems

Comparative Research on Wireless Network Data Transmission Experiment

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Abstract

For large data transfers to support communication services provider, the Internet broadband access technology must optimize backbone network to provide high quality services. World-wide network will become the third generation mobile system one of the key applications. Network structure for the introduction of new features should have strong flexibility, and asked the interim replacement for the existing features such flexibility is necessary. Because the communications business is not standardized, the creation of the business operator can be different for different programs. Modular, scalable structures and devices to enable the business evolves, to ensure return on investment, and a variety of carriers for different operating strategies. We show a possible way the development of core network, which with the existing operators, new technologies need to be consistent.

Keywords: broadband; optimize; flexibility; communications

1.Introduction

The development of 3G for the whole development of our country's information technology provides a new opportunity, on the one hand of the government's new public service platform in order to open the TD-SCDMA wireless cities, especially cities like Xiamen, very good applications, not only to provide a typical e-government as the main body, but also services to all industries, the government's resources to the open society, gave birth to many new business. There are in particular after the establishment of the Ministry of Industry, in particular, information technology and hope that the integration process of industrialization, through information on new services and enterprises to further the depth of integration of production and operation, management and its further transformation of industrial processes. On the upgrading of traditional industries have a role, that is, the two industry cooperative development.

3G currently concentrated in the larger cities of our country, the future development will be penetration into rural areas, as a broadband solution, but also solve the problem of urban and rural differences and well as a digital means.

 doi:10.1016/j.egypro.2012.02.098

Today's topic is about the future of broadband wireless in the development of people, but also deep thinking business models are still challenging problems. Themselves on the Internet, especially in the fixed Internet, the development process, especially from the perspective of operators, more and more data traffic and feel the difference between revenue problem. Especially with the development of 3G, P2P will continue to introduce high flow of business development, this large flow For operators would give birth to their business model a great impact. It can not simply be copied like the original 2G voice services to the core business model. We can also see itself as the mobile Internet, mobile network operators have a lot of special user-related information resources, but also has some control over the terminal market, terminal equipment, and they constitute a chain of mobile Internet industry is very special, Unlike traditional fixed Internet. This particular resources and capabilities, particularly among the industrial chain, including operators, SP, CP, terminal and network equipment, interactive relationship between the various links is very important. Should be very confident that we can explore in the 3G era for the gradual development of new mobile Internet business model.

In fact the development of 3G in the world is now showing rapid growth and popularization of knowledge, as our country is in the context of the economic crisis spawned out, shoulders pull our national economy and serve our national strategic goals important engine, broadband wireless mobile technology and industrial development is still very clear, the process of development is still healthy. Broadband wireless mobile to mobile Internet hosts also need this mode to explore all aspects of the industry chain, hoping to create a cooperation, open and healthy industry chain. I think this series based on the healthy development of all aspects, we are confident to build a broadband wireless mobile Internet booming drive chain

2.Wireless Transfer and Video

The first series of forward and revealed the next-generation IP-based QoS network performance, security, intelligent network management improvements, and profitable business model and to explore a new generation of IP-based FMCIMS / SIP multi-service networks smooth evolution of the pragmatic approach, which is a forward and backward compatibility, the evolution of effective in creating value added, and the next generation or the next-generation broadband wireless mobile NGBWM will also forward the concept, especially from the individual meaning with the individual point of view of the future NGN and GII and application level access and will include various types of satellite communications and satellite applications, including wireless communications world.

Throughout the development of global wireless mobile communications, the trend was eight, that broadband mobile, mobile broadband, data transmission, access diversity, network adaptive, system complementary integration, application personality / individual and line / wireless integration. And for the TCP / IP protocol substantive shortcomings, the United States launched program and our long-term planning in the "high Trusted Network" and other targets, the network system architecture and application of practical and effective security, management, health and economy of coercivity and other levels, completely updated from the source of continuous innovation.

Universal wireless access typically includes ground fixed wireless access, ground mobile access and satellite access Universal access to comprehensive, including great area, the macro area, cell, micro cell, pico cell, mobile, semi-mobile technological innovation and continuing uninterrupted, fixed and mobile interface is fuzzy, and a gradual convergence in one step.

The architecture is an important idea is the replacement of old for a variety of wireless communication access means, including a new generation of BFWA technology and mobile communication technology, and a variety of wired and wireless access methods, public, private and common ground , space and sea, broadcast, multicast, anycast, interactive, mobile, semi-mobile, nomadic, transportable, or stationary / fixed various other ways, the domain could be involved in the above covering a variety of categories, after the bridge in the world converge access channels, are unified and coordinated, complementary integration of work based on the core platform, to personalize the individual into the base, including person to person, person-to-machine (object), machine machine, including the effective connection and communication, the

formation of wired and wireless, fixed and mobile, and communications network, computer network and radio and television network that "network" of phase-organic integration.

The key common technology level, replacement of all types of wireless systems are giving top priority to the role of new technology is probably a common 20 or so, but the following 10 appear with the current needs of the wireless communications market is associated more closely, including satellite communications and digital trunking including mobile communications application. Frequency domain, time domain, space domain, the signal field, as well as the network domain, the display field of multidimensional signal processing and multi-dimensional frequency sharing, including

Efficient adaptive signal processing and statistical testing techniques, including adaptive interference cancellation and multi-user joint detection included. High-efficiency sector antenna, smart antenna, smart antenna and the corresponding distributed space-time coding techniques and software (defined) radio technology, including its high efficiency, high reliability algorithm, in order to effectively increase their capacity and spectrum reuse system efficiency.

Multi-sector multi-cell technology and integrated service platform to run multiple operating common platform for joint work technologies, including efficient use of total net resource scheduling algorithms. IP and all IP-adaptive IP-QoS technology, middleware and network / terminal information security technology, a set of software engineering techniques, including self-organizing, adaptive network topology and network optimization techniques.

3.Scalable Structures

Therefore, the key common technical level, with the continuous market-driven technological innovation guided to open, innovation and integration as the basic goals, different standards and heterogeneous systems and networks, in the longer period of time compatible with each other, complementary, overlapping coexistence development of the state both in the global sense, or at the national, regional, urban and indoor and outdoor sense, including the spectrum / orbit resources, competition, sharing and coordination, etc., are a common trend and can not avoid reality.

Related to broadband wireless mobile communication network optimization and related development strategies, some aspects of attention to the following may be useful:

Closer to independent innovation, to establish the "three level", "following guiding principles" as the basic principles, market-driven orientation, combined with specific environmental conditions, all-round innovation.

In different domains covering complementary heterogeneous network integration run-time network planning and design and implementation of optimization of processing equipment should fully absorb and use the wireless communication key common hardware and software technologies and new developments, including improvements, including planning and design means that room, both inside and outside and from the performance optimization of regional networks to improve, to CAPEX / OPEX savings, as well as the harmonious development of environment-friendly and so can a new level.

Since the development of broadband mobile technology, to less than 6GHz, and even less than 3GHz, and even less than the 900MHz frequency band resource demand conflicts more and more prominent; the one hand, frequency band such as planning and business development to develop appropriate and timely frequency of regulatory and market rules and policies, from a technical, business, marketing, operation and maintenance aspects of network construction, should be explored actively and effectively implement these rules and policies and measures required General Plan.

For multi-band, multi-format, multi-service, multi-operator environment, indoor and outdoor operation, attention should actively explore the harmonious development of complementary heterogeneous network, intensive outdoor base stations and radio and harmonious landscape building, effectively improve performance Super base composition, the evolution of the soft upgrade, distributed system architecture and adaptive resource management and adaptive network evolution and other effective solutions.

Whether it is site selection, resident processing, and more effective co-existence, and many other aspects of the system should be considered a positive win-win cooperation to build effective industrial chain and industry environment, and so on. Thus, the face of these realities, and actively explore the

complement of different coverage area network integration and optimization of the planning, design and equipment, and many other aspects of implementation, has obvious practical significance and strategic value, we can say it is worth exploring, the eternal theme of discussion and innovation.

Dedicated control signaling system is suitable for the larger cluster communication system, it is because the larger the signaling contact time is very important to a dedicated channel for control signaling channel. With the way control signaling system is suitable for relatively small cluster communication system, all channels used for voice channels and also for signaling channel, if the two channels used for control channel of the system will reduce the channel utilization.

That is, in this system, to each mobile station is assigned a dedicated time slot, if the mobile station has send the information to send in the signaling within the corresponding time slot, this time slot start timing signals derived by the same, or by base station alternate arrangements for individual users to send, the shortcomings of this approach is that when the user, the efficiency is not high. So it applies to users with less system.

In this system, each message will have a number of inspection dislocation, so that the base station can determine whether the received message is sent when the contract with the mobile collision caused by an error. If you are prepared to receive that response is sent error-free signaling, otherwise, the mobile station will be randomly selected re-message delay until the message is sent over so far.

In this way the cluster communication system, each base station has a logic board is responsible for control and signal channels transmitted. Exchange of information between the base station through a high-speed data bus to. Mobile station can be achieved in any free channel access operation. Since each channel it is necessary for voice transmission, but also transmit signaling. So it uses less than the voice band modulation with the way digital signaling, it can be transmitted simultaneously with voice, do not account for the channel. In addition, because each channel independently signaling exchange can be achieved in any free channel access operation of the system.

4.Experiments

Cluster communication is more than one user share a few radio channel. In order to ensure the confidentiality of communications and orderly, coordinated the work of the organic guarantee system, the system must have a perfect control and follow certain rules. This need for control and status that the signals and instructions.

Communication system to be used to distinguish the call of the useful signal, we used the voice signal control system to work outside of the non-voice signal and command system is called "signaling." Combined into a variety of signaling cluster communication system signaling system, it can be called a communication system of nerves. Determined by the signaling system can be good or bad communication system functions, signaling complex system of mobile communications systems and general communication system is an important distinction, the same time, the cluster communication system in order to achieve its powerful scheduling features, signaling systems will be more complicated.

First, the signaling function can be divided according to control signaling, selective call signaling, signaling the three dial-up; Another form of classification is based on signaling, signaling and digital simulation can be divided into two major categories of signaling. Control signaling used to control the base station and mobile station connection between the channel, disconnect and conversion of mobile radio channel. In addition, also used as a monitoring and status display. It includes various status monitoring signals, idle signals, distribution channels, removal of stitches, Override, demolitions, limit, location registration, remote death, alarm signaling, etc.

Selective call signaling is used to control the identity of the mobile station according to their own code access system, which includes single call, group call, group call signaling and so on. A cluster communication system has many mobile users, in order to breath in the number of users to which a user without causing pre-loaded state, provided to each mobile station to determine the address of a code, the other console in accordance with the selective call address code, so that can establish communication with the mobile users. The requirements of the selective call signaling is not only composed of simple numbers

can be as much as possible the number of requirements at the same time, high reliability, anti-jamming performance.

Signaling is a dual tone multi-frequency signals in the city if it is widely used. Communication system in the cluster, there is no unified regulations dual tone multi-frequency signaling specific definition, most manufacturers have their own settings, the actual design can be based on specific, signal types have been used appropriately increase or decrease. Special function signals, such as abbreviated dialing, call forwarding signals, self-provision, but not in contradiction with it. Usually refer to 90 series of mobile communication standard "small-capacity wireless phone automatic dialing system" on dual tone multi-frequency signaling uniform regulations.

This sub-audio signaling is the selective call signaling control the squelch, also known as a lock or tone squelch tone. It is a multiple channel communication system utilities in order to prevent interference and the use of a sub-audio signaling. It can effectively prevent unauthorized users into the system. Signaling is low in emission superimposed on the carrier sub-audio tone, each system has its own particular tone, when the transmitter each time a user calls open to the issue of the frequency of the tone, and continued throughout the duration of the call sent.

Digital signaling, with the rapid development of computer technology developed, the number of signaling due to transmission speed, the large number of group codes, easy integration, you can make smaller and smaller devices, communication systems in the cluster in recent years has been widely used .

Digital signaling can be divided into low and high speed categories. Two low-speed digital signaling to the modulation, for the first time in one or several audio modulating frequency, in the wireless channel simulation is still the second modulation. High-speed direct modulation of signaling is generally in the wireless channel, due to high speed, often in several re-development and more complex error correction encoding method to solve the problem of transmission errors occur. In the transmission of digital signaling, in order to facilitate the receiving end decode, usually require a certain format for encoding digital signaling.

For the wireless market in the policy is driven by the market reforms and the introduction of new technology, which makes the third generation mobile communication system aims difficult to determine. Similarly, large investments in the current second generation systems into the primary requirement is the profit before the third generation systems. However, it has the third-generation technology to build the basic framework. Standardization of third generation mobile communication challenge is to require it to be more open and flexible as possible to gain market recognition.

The available spectrum is a new communications system whether the economic prerequisites for success. Therefore, WARC1992tilt community wireless management meeting) for the third generation mobile communication system to determine the use of the spectral range.

The main low frequency spectrum allocated to the second generation systems. Most countries follow the frequency allocation. In China, most of the spectrum are assigned to the wireless local loop applications. At present, no third-generation mobile communication system for the general band. The second generation systems to third-generation system development and transition. In different regions, various second-generation mobile communication system has been applied, and began to third generation mobile communication system development and transition. Improved methods for the fixed network have been conceived among the wireless interface, you need a completely innovative approach to support high-speed data transfer rate business. This prompted a third generation mobile communication system from the expansion of capacity, core network GSM 2 business data transfer rate of increase, until the application of wireless multimedia gradually introduced.

Second-generation systems to third-generation system development and transition of the objective is to ensure the system of second-generation core network or progressive investment, while relying on existing infrastructure and to ensure that the second generation to third generation systems system migration and conversion to the dual-mode terminals.

If the business district and other areas in the beginning, such as the development of the system needs more capacity and more advanced services. It shows the existing transmission and each has a different interface, full network system for the introduction of a possible third-generation system development

program. For mobile operators and fixed network operators development of two different starting point must be seriously.

Third generation mobile communication system with public third-generation radio access network and personal network connectivity. The second generation system in order to maintain the business coverage, dual-mode terminal and the second generation should be able to connected to pass. These wireless access networks should also be related to the fixed network connectivity:

5.Conclusions

Mobile multimedia services includes voice, audio, video, such as Web pages and hypertext markup language such as Java animation text and images of activities, such as IP, real-time flow of graphic animation, as well as the data used for file transfer and e-mail. Therefore, the Internet multimedia service class of business will occupy the main part. In the receive and transmit media streams in parallel independent of each other, you can use a separate transmission path; in receiving and sending related media stream, it is recommended to use a single network path. All have the support of the core network. Therefore, a key requirement for the development of GSM is able to support multimedia services, high speed data transmission services, virtual local environment, mobile software download and global roaming services. Main goal is to have a compelling new features of next-generation mobile terminals, such as personal digital assistants, wireless laptop computers, communication equipment and the latest wireless technology. Network should be flexible as far as possible, and through high-level business information channel to the fixed-mobile convergence IN sub-layer open. Cordless phones and fixed users in the same business area mobile users should also be supported.

Acknowledgment

Grant: authors' key project from The Education Bureau Of Zhejiang Province, China, 200805315.

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